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APPLICATION NO.	FILING DATE	FIRST NAMED INVENTOR	ATTORNEY DOCKET NO.	CONFIRMATION NO.
10/617,864	07/14/2003	Koichiro Nakatani	115932	3812

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EXAMINER	
TRAN, BINH Q	
ART UNIT	**PAPER NUMBER**
3748	

DATE MAILED: 08/11/2005

Please find below and/or attached an Office communication concerning this application or proceeding.

Office Action Summary	Application No.	Applicant(s)	
	10/617,864	NAKATANI ET AL.	
	Examiner	Art Unit	
	BINH Q. TRAN	3748	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If the period for reply specified above is less than thirty (30) days, a reply within the statutory minimum of thirty (30) days will be considered timely.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

Status

1)☒ Responsive to communication(s) filed on *17 May 2005*.

2a)☐ This action is **FINAL**. 2b)☒ This action is non-final.

3)☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

Disposition of Claims

4)☒ Claim(s) *1-26* is/are pending in the application.

4a) Of the above claim(s) _____ is/are withdrawn from consideration.

5)☐ Claim(s) _____ is/are allowed.

6)☒ Claim(s) *1-22,25 and 26* is/are rejected.

7)☒ Claim(s) *23-24* is/are objected to.

8)☐ Claim(s) _____ are subject to restriction and/or election requirement.

Application Papers

9)☐ The specification is objected to by the Examiner.

10)☐ The drawing(s) filed on _____ is/are: a)☐ accepted or b)☐ objected to by the Examiner.

Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).

Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).

11)☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

Priority under 35 U.S.C. § 119

12)☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).

a)☒ All b)☐ Some * c)☐ None of:

1.☒ Certified copies of the priority documents have been received.

2.☐ Certified copies of the priority documents have been received in Application No. _____.

3.☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

* See the attached detailed Office action for a list of the certified copies not received.

Attachment(s)

1) ☒ Notice of References Cited (PTO-892)
2) ☐ Notice of Draftsperson's Patent Drawing Review (PTO-948)
3) ☐ Information Disclosure Statement(s) (PTO-1449 or PTO/SB/08) Paper No(s)/Mail Date _____.
4) ☐ Interview Summary (PTO-413) Paper No(s)/Mail Date. _____.
5) ☐ Notice of Informal Patent Application (PTO-152)
6) ☐ Other: _____.

DETAILED ACTION

This office action is in response to the amendment filed May 17, 2005.

Claim Rejections - 35 USC § 112

The following is a quotation of the ***first paragraph*** of 35 U.S.C. 112:

> The specification shall contain a written description of the invention, and of the manner and process of making and using it, in such full, clear, concise, and exact terms as to enable any person skilled in the art to which it pertains, or with which it is most nearly connected, to make and use the same and shall set forth the best mode contemplated by the inventor of carrying out his invention.

Claims 1-26 are rejected under 35 U.S.C. 112, first paragraph, as containing subject matter which was not described in the specification in such a way as to reasonably convey to one skilled in the relevant art that the inventor(s), at the time the application was filed, had possession of the claimed invention. The added material which is not supported by the original disclosure is as follow: ***" a diesel"*** is disclosed in claims 1 and 12. Applicants are required to cancel the new matter in the reply to this Office Action.

Claim Rejections - 35 USC § 102

The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

> A person shall be entitled to a patent unless –
>
> (b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.
> (e) the invention was described in-
> (1) an application for patent, published under section 122(b), by another filed in the United States before the invention by the applicant for patent, except that an international application filed under the treaty defined in section 351(a) shall have the effect under this subsection of a national application published under section 122(b)

only if the international application designating the United States was published under Article 21(2)(a) of such treaty in the English language; or
(2) a patent granted on an application for patent by another filed in the United States before the invention by the applicant for patent, except that a patent shall not be deemed filed in the United States for the purposes of this subsection based on the filing of an international application filed under the treaty defined in section 351(a).

Claims 1-22, and 25-6 are rejected under 35 U.S.C. 102 (b) as being anticipated by Hepburn et al. (Hepburn) (Patent Number 5,974,788).

Regarding claims 1, and 12, Hepburn discloses an exhaust emission control method and apparatus for treating exhaust gas emitted from an internal combustion engine (1), comprising the steps of locating an emission control device in an exhaust gas passage of the internal combustion engine, the emission control device (e.g. 32) storing SOx when an air/fuel ratio of exhaust gas flowing through the emission control device is lean, and releasing the stored SOx when a temperature of the emission control device is raised to a desulfurization temperature or higher and the air/fuel ratio of the exhaust gas flowing through the emission control device becomes substantially equal to a stoichiometric air/fuel ratio or rich (e.g. See col. 5, lines 1-67; col. 6, lines 1-22); performing a temperature control process to control the temperature of the emission control device to be within a predetermined temperature range whose lower limit is substantially equal to or higher than a desulfurization temperature and to raise the temperature of the emission control device when the air/fuel ratio of exhaust gas is leaner than the stoichiometric air/fuel ratio (e.g. See Table 1; col. 5, lines 1-67; col. 6, lines 1-22); and performing a desulfurization process to release sulfur from the emission control device by controlling the air/fuel ratio of the exhaust gas flowing through the emission control device to be substantially equal to the stoichiometric air/fuel ratio or rich when the temperature of the emission control device is within the predetermined temperature range, wherein the temperature

control process and the desulfurization process are repeated when sulfur is to be released from the emission control device (e.g. See Table 1; col. 5, lines 1-67; col. 6, lines 1-22).

Regarding claims 2, and 13, Hepburn further discloses that in the temperature control process, the temperature of the emission control device is raised or lowered by controlling the air/fuel ratio of the exhaust gas flowing through the emission control device (e.g. See Table 1; col. 5, lines 1-67; col. 6, lines 1-22).

Regarding claims 3, and 14, Hepburn further discloses that wherein an amount of the exhaust gas flowing through the emission control device is larger in the temperature control process than that in the desulfurization process (e.g. See Table 1; col. 5, lines 1-67; col. 6, lines 1-22).

Regarding claims 4, and 15, Hepburn further discloses that wherein the temperature control process and the desulfurization process are repeated until release of sulfur from the emission control device is finished (e.g. See Table 1; col. 5, lines 1-67; col. 6, lines 1-22).

Regarding claims 5, and 16, Hepburn further discloses that wherein the temperature control process and the desulfurization process are repeated until a total time of execution of the desulfurization process reaches a set value (e.g. See Table 1; col. 5, lines 1-67; col. 6, lines 1-22).

Regarding claims 6, and 17, Hepburn further discloses that wherein the temperature control process and the desulfurization process are repeated a predetermined number of times (e.g. See Table 1; col. 5, lines 1-67; col. 6, lines 1-22).

Regarding claims 7, and 18, Hepburn further discloses that wherein the temperature control process continues for a first predetermined period of time and the desulfurization process

continues for a second predetermined period of time (e.g. See Table 1; col. 5, lines 1-67; col. 6, lines 1-22).

Regarding claims 8, and 19, Hepburn further discloses that wherein at least one of the first predetermined period of time and the second predetermined period of time is determined depending upon an operating state of the internal combustion engine (e.g. See Table 1; col. 5, lines 1-67; col. 6, lines 1-22).

Regarding claims 9, and 20, Hepburn further discloses that wherein the first predetermined period of time for the temperature control process is corrected according to a rate of increase or decrease of the temperature of the emission control device, and the second predetermined period of time for the desulfurization process is corrected according to a speed of release of sulfur from the emission control device (e.g. See Table 1; col. 5, lines 1-67; col. 6, lines 1-22).

Regarding claims 10, and 21, Hepburn further discloses that wherein the air/fuel ratio of the exhaust gas flowing through the emission control device is controlled in the temperature control process according to a rate of increase or decrease of the temperature of the emission control device, and the air/fuel ratio of the exhaust gas flowing through the emission control device is controlled in the desulfurization process according to a speed of release of sulfur from the emission control device (e.g. See Table 1; col. 5, lines 1-67; col. 6, lines 1-22).

Regarding claims 11, 22, and 25-26, Hepburn further discloses that wherein the emission control device comprises a NOx storage agent that stores NOx when the air/fuel ratio of the exhaust gas flowing through the NOx storage agent is lean, and releases the stored NOx for reduction and removal when the air/fuel ratio of the exhaust gas flowing through the NOx

storage agent is reduced and a reductant is present in the exhaust gas (e.g. See Table 1; col. 5, lines 1-67; col. 6, lines 1-22).

Claims 1-22, and 25-26 are rejected under 35 U.S.C. 102 (b) as being anticipated by Hirota et al. (Hirota) (Patent Number 6,502,391).

Regarding claims 1, and 12, Hirota discloses an exhaust emission control method and apparatus for treating exhaust gas emitted from an internal combustion engine (1), comprising the steps of locating an emission control device in an exhaust gas passage of the internal combustion engine, the emission control device (e.g. 21, 24) storing SOx when an air/fuel ratio of exhaust gas flowing through the emission control device is lean, and releasing the stored SOx when a temperature of the emission control device is raised to a desulfurization temperature or higher and the air/fuel ratio of the exhaust gas flowing through the emission control device becomes substantially equal to a stoichiometric air/fuel ratio or rich (e.g. See col. 19, lines 19-59); performing a temperature control process to control the temperature of the emission control device to be within a predetermined temperature range whose lower limit is substantially equal to or higher than a desulfurization temperature and to raise the temperature of the emission control device when the air/fuel ratio of exhaust gas is leaner than the stoichiometric air/fuel ratio (e.g. See col. 19, lines 59-67; col. 20, lines 1-67); and performing a desulfurization process to release sulfur from the emission control device by controlling the air/fuel ratio of the exhaust gas flowing through the emission control device to be substantially equal to the stoichiometric air/fuel ratio or rich when the temperature of the emission control device is within the predetermined temperature range, wherein the temperature control process and the

desulfurization process are repeated when sulfur is to be released from the emission control device (e.g. See col. 19, lines 19-67; cols. 20-22, lines 1-67; col. 23, lines 1-33).

Regarding claims 2, and 13, Hirota further discloses that in the temperature control process, the temperature of the emission control device is raised or lowered by controlling the air/fuel ratio of the exhaust gas flowing through the emission control device (e.g. See col. 19, lines 59-67; col. 20, lines 1-67).

Regarding claims 3, and 14, Hirota further discloses that wherein an amount of the exhaust gas flowing through the emission control device is larger in the temperature control process than that in the desulfurization process (e.g. See col. 19, lines 59-67; col. 20, lines 1-67).

Regarding claims 4, and 15, Hirota further discloses that wherein the temperature control process and the desulfurization process are repeated until release of sulfur from the emission control device is finished (e.g. See col. 19, lines 59-67; col. 20, lines 1-67).

Regarding claims 5, and 16, Hirota further discloses that wherein the temperature control process and the desulfurization process are repeated until a total time of execution of the desulfurization process reaches a set value (e.g. See col. 19, lines 59-67; col. 20, lines 1-67).

Regarding claims 6, and 17, Hirota further discloses that wherein the temperature control process and the desulfurization process are repeated a predetermined number of times (e.g. See col. 19, lines 59-67; col. 20, lines 1-67).

Regarding claims 7, and 18, Hirota further discloses that wherein the temperature control process continues for a first predetermined period of time and the desulfurization process continues for a second predetermined period of time (e.g. See col. 19, lines 19-67; cols. 20-22, lines 1-67; col. 23, lines 1-33).

Regarding claims 8, and 19, Hirota further discloses that wherein at least one of the first predetermined period of time and the second predetermined period of time is determined depending upon an operating state of the internal combustion engine (e.g. See col. 19, lines 19-67; cols. 20-22, lines 1-67; col. 23, lines 1-33).

Regarding claims 9, and 20, Hirota further discloses that wherein the first predetermined period of time for the temperature control process is corrected according to a rate of increase or decrease of the temperature of the emission control device, and the second predetermined period of time for the desulfurization process is corrected according to a speed of release of sulfur from the emission control device (e.g. See col. 19, lines 19-67; cols. 20-22, lines 1-67; col. 23, lines 1-33).

Regarding claims 10, and 21, Hirota further discloses that wherein the air/fuel ratio of the exhaust gas flowing through the emission control device is controlled in the temperature control process according to a rate of increase or decrease of the temperature of the emission control device, and the air/fuel ratio of the exhaust gas flowing through the emission control device is controlled in the desulfurization process according to a speed of release of sulfur from the emission control device (e.g. See col. 19, lines 19-67; cols. 20-22, lines 1-67; col. 23, lines 1-33).

Regarding claims 11, 22, and 25-26, Hirota further discloses that wherein the emission control device comprises a NOx storage agent that stores NOx when the air/fuel ratio of the exhaust gas flowing through the NOx storage agent is lean, and releases the stored NOx for reduction and removal when the air/fuel ratio of the exhaust gas flowing through the NOx storage agent is reduced and a reductant is present in the exhaust gas (e.g. See col. 19, lines 19-67; cols. 20-22, lines 1-67; col. 23, lines 1-33).

Allowable Subject Matter

Claims 23-24 are objected to as being dependent upon a rejected base claim, but would be allowable if rewritten in independent form including all of the limitations of the base claim and any intervening claims.

Since allowable subject matter has been indicated, applicant is encouraged to submit formal drawings in response to this Office action. The early submission of formal drawings will permit the Office to review the drawings for acceptability and to resolve any informalities remaining therein before the application is passed to issue. This will avoid possible delays in the issue process.

Response to Arguments

Applicant's arguments filed November 10, 2003 have been fully considered but they are not completely persuasive. Claims 1-26 are pending.

Applicant's cooperation in correcting the informalities in the specification is appreciated. Applicant's cooperation in explaining the claims subject matter more specific to overcome the rejection is also appreciated.

Applicants' s arguments with respect to claims 1-26 have been considered but are moot in view of the new ground(s) of rejection as discussed above.

Conclusion

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Examiner Binh Tran whose telephone number is (571) 272-4865. The examiner can normally be reached on Monday-Friday from 8:30 a.m. to 5:00 p.m.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Thomas E. Denion, can be reach on (571) 272-4859. The fax phone numbers for the organization where this application or proceeding is assigned are (703) 872-9306 for regular communications and for After Final communications.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see http://pair-direct.uspto.gov. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

BT
August 02, 2005

Binh Q. Tran
Patent Examiner
Art Unit 3748